

**EXPERIMENTS,
AND
OBSERVATIONS,
About the
Mechanical Production
OF
ODOURS.**

By the Honourable
ROBERT BOYLE Esq;
Fellow of the *R. Society.*

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F.R.S.

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ODOURS.

Since *Tasts* and *Odours* (perhaps by reason of the nearness of the Organs they affect) are wont, by Physical Writers, to be treated of next to one another, I also shall imitate them in handling those two Qualities, not onely for the intimated Reason, but because, what I have premised in general, and some other things that I have said already under the Title of *Tasts*, being applicable

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to

Of the Mechanical
to Odours also, 'twill not be necessa-
ry, and therefore 'twould be tedious,
to repeat them here.

EXPER. I.

*With two Bodies, neither of them odo-
rous, to produce immediately a strong
Urinous smell.*

TAKE good Quick-lime and Sal
Armoniac, and rub or grind
them well together, and holding
your Nose to the mixture, you will
be saluted with an Urinous smell
produced by the particles of the vo-
latil Salt, untied by this operation,
which will also invade your Eyes, and
make them to water.

EX-

EXPER. II.

By the bare addition of common Water,
to produce immediately a very strong
smell in a Body that had no such
smell before.

THis is one of the Phenomena
of an Experiment made with
Camphire and Oil of Vitriol, which
I have elsewhere mentioned to ano-
ther purpose. For, if in that cor-
rosive *Menstruum* you dissolve a good
proportion, but not too much, of the
strongly sented Gum, the odour of
the Camphire will be quite concealed
in the mixture; but if you pour this
mixture into a good quantity of fair
Water, the dissolved Gum will im-
mediately recover out of the *Men-
struum*, and smell as strong as before;
if not (by reason of the warmth pro-
duced in the Operation) more
strongly.

EX-

EXPER. III.

Of producing some Odours, each of them quite differing from that of any of the Ingredients.

HAVING taken two ounces (or parts) of clear Oil of Turpentine, and mixt it with one ounce (or part) of Oil of Vitriol, (which must be done by degrees, for otherwise the Vessel will be endangered,) the clear Liquour that came over, upon the distillation of the mixture in a Sand-furnace, in stead of the odour of Turpentine, (for the Oil of Vitriol alone is wont to be inodorous,) smelt very strong of Sulphur; insomuch that once, when I shewed this Experiment, approaching my Nose very boldly and hastily to the Receiver newly severed from the Retort, the sulphureous stink proved so strong, that it had almost (to speak with the vulgar) taken away my breath. And to illustrate yet farther the possible
emer-

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emergency of such odours upon the mixture of Ingredients, as neither of them was apart endowed with, we caused the substance that remained behind in the Retort (in the form of a thin extract) after one of the newly mentioned Distillations to be farther pressed by a stronger fire, which forced most of it over, partly in the form of a thick Oil, and partly in that of Butter; both which we keep together in the same Vial, because their odour is neither that of Oil of Turpentine, nor that of Brimstone, but they smell exceedingly like the distilled Oil of Bees-wax.

EXPER. IV.

About the production of some Odours by Local motion.

I Shall not now examine, whether the Local motion of an external Agent may not, without materially concurring to the operation, produce,

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duce, by agitating and shuffling the parts, odorous corpuscles: But that the celerity and other modifications of the Local motion of the *effluvia* of Bodies may not onely serve to diversifie their odours, but so far produce them, as to make them perceptible by the sense, which otherwise would not be so, may be gathered from some observations, which, being obvious, are not so proper for this place. Wherefore I shall rather take notice, that I know several Bodies that are not onely inodorous when cold, but when considerably hot, and are fixt in the fire, and yet, by having their parts put into a peculiar kind of agitation, will presently grow plainly odorous. On this occasion I shall add, that, as there are some very hard Woods, that acquire a strong smell by the motion they may be exposed to in a Turner's Lath, (as I have observed by trialls particularly made with the hard and ponderous *Lignum Vitæ*;) so some afford, whilst the operation lasts, an unexpected odour.

And

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And having inquired about this matter of two eminent Artists, (whom I often employ,) concerning the odour of Beech-wood whilst it is turning, they both agreed, that it would emit well-sented *effluvia*. And one of them affirmed to me farther, that, having bought a great block of that Wood, to make divers pieces of workmanship with it, when he came to turn it, there would issue out not onely a copious odour, but of such a peculiar fragrancý, that one that knew not whence it proceeded would have concluded he was smelling Roses.

EXPER. V,

By mixing a good proportion of a very strongly sented Body with an almost inodorous one, to deprive it speedily of all its smell.

TAKE Salt of Tartar, and drop upon it either Spirit of Nitre or Aqua fortis not too much dephlegmed,

phlegmed, till all the effervescence
cease, and the Liqueur will no longer
work upon the Alkali. These, by a
slow Evaporation of the superfluous
moisture, may be made to shoot into
Crystals like those of Nitre, which,
after you have (if need be) by rub-
bing them with a dried cloath, freed
them from loose adhering Corpus-
cles, will emulate Salt-peter, as in
other Qualities; so in its not being o-
dorous; though, if you distill them,
or burn them on kindled coals, their
fumes will quickly make you sen-
sible, that they abounded with the
stinking Spirits, that make *Aqua fortis*
so offensive to the smell,

EXPER. V.

~~It is a good proportion of a very
strongly fixed Body with an alkali
to deprive it of its~~

EX-
The Salt of Tartar and drop
upon it either some of
or Aqua fortis not too much de-
phlegmed

Production of Odours.

EXPER. VI.

*By pulsting a very strongly stinking Body
to another of a not sweet smell; to
produce a mixture of a pleasant and
strongly Aromatick odour.*

WHAT is here proposed is per-
formed at the same time that
the Eleventh of the foregoing Expe-
riments of Tasts is made. For the
Liquour thereby produced, if it be
well prepared, has not onely a spicy
tast, but also a kind of Aromatick
and pleasant smell; and I have some
now by me, that, though kept not
over-carefully, does, after some
years, retain much of its former o-
dour, though not so much as of its
tast.

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Of the Chymical

EXPER. VII.

*By digesting two Bodies, neither of them
well sented, to produce Bodies of a
very subtile and strongly fragrant
odour.*

WE took a pound (for instance)
of Spanish Wine, and put to
it some ounces of Oil of Vitriol;
then, keeping them for a reasonable
time in digestion, we obtained, as we
expected, a mixture odoriferous e-
nough. But this Triall you will find
improved by that which insues.

EX-

EXPER. VIII.

By the bare addition of a Body almost
inodorous, and not well sented, to
give a pleasant and Aromatick smell
to Spirit of Wine.

THis we have several times done,
by the ways elsewhere related
for another scope, the summ of which,
as far as it needs be mentioned in
this place, is this.

We took good Oil of blew Vitriol
(that was brought from *Dantzick*,)
though the very common will serve
well, and having put to it, by de-
grees, an equal weight of Spirit of
Wine totally inflammable, we dige-
sted them together, for two, three,
or four weeks, (sometimes much
longer, and then with better success)
from which, when we came to distill
the mixture, we had a very fragrant
Spirit, which was sometimes so sub-
tile, that, though distilled in a tall
Glass with a gentle Heat, it would
(in

(in spite of our care to secure the closeness of the Vessels at the junctures) pierce through, and fill the Laboratory with a perfume, which, though men could not guess what body afforded it, yet they could not but wonder at it. Whence we may learn, both *how much* those spirituous and inflammable particles, the Chymists call the vegetable Sulphur of Wine, may work on and enoble a mineral Sulphur; (for, that such an one there is in Oil of Vitriol, I have elsewhere proved by experience;) and *how much* the new Commissions and Contextures made by digestion may alter the odours of Bodies, whether Vegetable or Mineral. That also another Constitution of the same matter, without any manifest addition or recess of particles, may proceed to exhibit a very differing smell, will appear by the following Trial.

EX.

EXPER. IX.

To make the forementioned fragrant Body, without addition or fire, degenerate into the rank smell of Garlick.

TO make out this, I need onely relate, that I have more than once put the above mentioned fragrant Lignour in stop'd Glasses, whereof the one, and not the other, stood in a warm place, till in process of time I found that odoriferous Lignour so to degenerate in point of sent, that one would have thought it to have been strongly infected with Garlick. And the like unpleasant Smell I observed in a certain Oil made of Vegetable and Mineral Substances distilled together.

And on this occasion I will add, (though not as an Argument,) this Observation, which though I shall not undertake it will always succeed, I think may not impertinently be set down

down in this place, partly because of the likeness of the odour produced, to that which was the effect of the last named Trial; and partly (or rather chiefly) because it may shew us, that a Body, which itself is not onely inodorous, but very fixt, may yet, in some cases, have a great stroke in the *Phenomena* of Odours; whether by being wrought on by, and sometimes mingled with, the parts of the odorous body, and thereby giving it a new modification, I shall not now stay to enquire.

We took then good Salt of Tartar, and put to it several times its weight of the exprest juice of Onions; we kept them in a light digestion for a day or two, and then unstopping the Vial, we found the former smell of the Onions quite degenerated into a rank smell of Garlick, as was judg'd, even when fresh juice of Garlick was procured to compare them. To vary this Experiment, we made with fixt Salts, and some other strongly sented Juices, Trials, whose events

would

'twould

'twould perhaps be tedious here to relate.

EXPER. X.

With an inodorous Body, and another not well-sented, to produce a muskie smell.

THis we have sometimes done by casting into Spirit (not Oil) of Vitriol a large proportion of small Pearls unbroken. For the action of the acid Menstruum upon these being moderated, partly by the weakness of the Menstruum, and partly by the intireness of the Pearls, the dissolution would sometimes last many hours. Holding from time to time my nose to the open orifice of the Glass, 'twas easie to perceive a pleasant muskie smell, which also others, to whom I mentioned it, took notice of as well as I. And, if I misremember nor, I took notice of the like smell, upon Pearls not onely

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dissol-

dissolved in Spirit of Vinegar, but in another Lignour that had but a bad sent of its own. The foregoing Experiment calls to my mind that which follows.

EXPER. XI.

With fixt Metals, and Bodies either inodorous or stinking, to produce strong and pleasant smells, like those of some Vegetables and Minerals.

THAT Gold is too fixt a body to emit any odour, and that Aqua Regis has an odour that is very strong and offensive, I think will be easily granted. But yet Aurum fulminans being made (as is known) by precipitating with the inodorous Oil of Tartar the Solution made of the former in the latter, and this Precipitate being to be farther proceeded with in order to another Experiment; we fulminated it *per se* in a Silver Vessel like that, but better

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ter contrived, that is (if I misremem-
ber not) somewhere described by
Glaliberus. And among other *Pha-*
semina of this operation, that belong
not to this place, we observed with
pleasure, that, when the fulmination
was recently made, the steams, which
were afforded by the metal that had
been fired, were endowed with a de-
lightful smell, not unlike that of musk.
From which Experiment and the
 foregoing we may learn, that Art,
by lucky Contextures, may imitate
the odours that are presumed to be
natural and specifick; and that Mi-
neral and Vegetable Substances may
compound a smell that is thought to
be peculiar to Animals.

And as Art sometimes imitates Na-
ture in the production of Odours, as
may be confirmed by what is above
related concerning counterfeit Ras-
berry Wine, wherein
those that drank it be-
lieved they did not only
tast, but smell the Ras-
berry; so sometimes Nature seems

*See in the
Paper of Tasts,
Exper. XII.*

to imitate her self, in giving like odours to bodies extremely differing. For, not yet to dismiss the smell of Musk, there is a certain Seed, which, for the affinity of its odour to that perfume, they call the *Musk-seeds*; and indeed, having some of it presented me by a Gentleman, that had newly brought it from the *West-Indies*, I found it, whilst 'twas fresh, to have a fragrantcy suitable to the name that was given it. There is also a sort of Rats in *Muscovy*, whose skins, whereof I have seen several, have a smell that has procured them the name of *Musk-Rats*. To which I know not, whether we may not add the mention of a certain sort of Ducks, which some call *Musk-Ducks*; because at a certain season of the year, if they be chaf'd by violent motion, they will under the wing emit a musky instead of a sweaty sent; which upon trial I perceived to be true. On the other side, I have known a certain Wood growing in the *Indies*, which, especially when the sent is excited by rub-

rubbing, stinks so rankly and so like Paracelsus's *Zibetum Occidentale*, (*stercus Humanum*;) that one would swear it were held under his Nose. And since I have been speaking of good scents produced by unlikely means, I shall not pretermitt this Observation, that, though generally the fire impresses a strong offensive smell, which Chymists therefore call *Empyreumatical*, upon the odorous bodies that it works strongly on; yet the constitution of a body may be such, that the new Contexture that is made of its parts, even by the violence of the fire, shall be fit to afford Effluviūms rather agreeable to the organs of smelling, than any way offensive. For I remember, that, having for a certain purpose distilled *Saccharum Saturni* in a Retort with a strong fire, I then obtained, (for I dare not undertake for the like success to every Experimenter,) besides a piercing and *Empyreumatical* Liquour that was driven over into the Receiver, a good Lump of a *Caput*

Mortuum of a grayish colour, which, notwithstanding the strong impression it had received from the fire, was so far from having any *Empyreumatical* sent, that it had a pleasing one, and when 'twas broken, smelt almost like a fine Cake new baked, and broken whilst yet warm. And ~~at~~ the fire, notwithstanding the *Empyreuma* it is wont to give to almost all the bodies it burns, may yet be reduced to confer a good smell on some of them, if they be fitted upon such a contexture of their parts to emit steams of such a nature, (whatever were the efficient cause of such a contexture;) so we observe in the *Musk animal*, that Nature in that Cat, or rather Deer, (though it properly belongs to neither kind,) produces Musk by such a change, as is wont in other Animals to produce a putrefactive stink. So that, provided a due constitution of parts be introduced into a portion of matter, it may on that account be endowed with noble and desirable Sents, or other Qualities, though

though that Constitution were introduced by such unlikely means, as Combustion and Putrefaction themselves. In Confirmation of which, I shall subjoyn in the ensuing account a notable, though casual, Phenomenon, that occur'd to a couple of *Virtuosi* of my Acquaintance.

An eminent Professor of Mathematicks affirmed to me, that, chancing one day in the heat of Summer with another Mathematician (who I remember was present when this was told) to pass by a large Dunghil that was then in *Lincolns-Inn-fields*, when they came to a certain distance from it, they were both of them surprized to meet with a very strong smell of Musk, (occasioned, probably, by a certain degree or a peculiar kind of Putrefaction,) which each was for a while shy of taking notice of, for fear his Companion should have laughed at him for it; but, when they came much nearer the Dunghill, that pleasing smell was succeeded by a stink proper to such a heap of Excrements,

crements. This puts me in mind of adding, that, though the excrements of Animals, and particularly their sweat, are usually foetid; yet, that 'tis not the nature of an excrement, but the constitutions, that usually belong to them, make them so, hath seemed probable to me upon some Observations. For, not to mention, what is related of *Alexander the Great*, I knew a Gentleman of a very happy Temperature of body, whose sweat, upon a critical examination, wherein I made use also of a surprize, I found to be fragrant; which was confirmed also by some Learned men of my acquaintance, and particularly a Physician that lay with him.

Though *Civet* usually passes for a Perfume, and as such is wont to be bought at a great rate; yet it seems to be but a clammy excrement of the Animal that affords it, which is secreted into Bags provided by Nature to receive it. And I the rather mention *Civet*, because it usually affords
a Phaz-

a Phenomenon that agrees very well with the Mechanical Doctrine concerning *Odours*; though it do not demonstrate it. For, when I have had the curiosity to visit divers of those Civet-Cats, (as they call them) though they have heads liker Foxes than Cats; I observed, that a certain degree of Laxity (if I may so style it) of the odorous Atmosphere was requisite to make the smell fragrant. For, when I was near the Cages, where many of them were kept together, or any great Vessel full of Civet, the smell (probably by the plenty, and perhaps the over-brisk motion of the *effluvia*,) was rather rank and offensive than agreeable; whereas, when I removed into the next room, or to some other convenient distance, the steams (being less crowded, and farther from their fountain,) presented themselves to my Nostrills under the notion of a Perfume.

And, not to dismiss this our Eleventh Experiment without touching once more

more upon Musk, I shall add, that an Ingenious Lady, to whom I am nearly related, shewed me an odd *Monkey*, that had been presented her as a rarity by the then Admiral of *England*, and told me, among other things, that she had observed in it, that, being sick, he would seek for Spiders as his proper remedies, for some of which he then seemed to be looking, and thereby gave her occasion to tell me this; which when he had eaten, the alteration it made in him would sometimes fill the room with a musky sent: But he had not the good luck to light on any whilst my visit lasted.

EXPER. XII.

To heighten good smells by Composition.

TIS well known to Perfumers, and is easie to be observed, that Amber-greece alone, though esteemed the best and richest perfume that

that is yet known in the world, has but a very faint and scarce a pleasant sent. And I remember, that I have seen some hundreds of ounces together newly brought from the *East-Indies*; but if I had not been before acquainted with the smell of Amber-greece alone, and had had onely the vulgar conceit of it, that 'tis the best and strongest of perfumes, my Nostrills would scarce have made me suspect those lumps to have been any thing a-kin to Amber-greece. But if a due proportion of Musk, or even Civet, be dexterously mixt with Amber, the latent fragrancie, though it be thereby somewhat compounded, will quickly be called forth, and exceedingly heightened. And indeed 'tis not, as 'tis commonly presumed, the plenty of the richest Ingredients, as Amber-greece and Musk, but the just proportion and skilful mixture of them, that makes the noblest and most lasting perfume, of which I have had sufficient experience; so that with a far less quantity of Musk
and

and Amber, than not onely ordinary persons, but Perfumers themselves are wont to imploy, we have had several Perfumes, that for fragrancy were much preferred to those where Musk and Amber-greece are so plentifully imployed. The proportions and ways of mixture we best approved of, would be too long, and are not necessary, to be here set down; but you will not much erre in making use of such a proportion as this, viz. eight parts of Amber-greece, two of Musk, and one of Civet: which quantities of Ingredients if they be skilfully and exactly mingled, you will not miss of a good Composition, with which you may innoble other materials, as *Benzoin*, *Starac*, sweet Flowers, &c. fit to make Pastills, Ointments for Leather, Pomerander, &c. And we may here add, that, upon the score of the new Texture acquired by Composition, some things, that are not fragrant themselves, may yet much heighten the fragrancy of Odoriferous bodies.

And

And of liquid perfumes I remember, 'twas the secret of some Court-Ladies, noted for Curiosity about perfumes, to mingle always a due proportion of Wine-vinegar with the odoriferous Ingredients. And on this occasion, to shew the power of mixtures in improving *Odours*, I shall add something about a Liqueur of mine, that has had the good fortune to be very favourably spoken of by persons of Quality accustomed to choice Perfumes. This Liqueur, though thought an elaborate preparation, as well for another reason, as to recommend it to some, whose Critical palates can tast the very titles of things, I called it *Essence of Musk*, is indeed a very plain simple preparation, which I thus make.

I take an arbitrary Quantity of choice Musk without finely powdering it, and pour upon it about a finger's breadth of pure Spirit of Wine; these in a Glass closely stopt I set in a quiet place to digest, without the help of any Furnace, and
after

after some days, or a few weeks, (according as Circumstances determined,) the Spirit, which is somewhat odd, will in the cold have made a solution of the finest parts of the Musk, and will be thereby much tinged, but not of a red colour. This Liqueur being decanted, I keep by it self as the richest of all, and pour a like quantity of Spirit on the remaining Musk, which usually will in the cold, though more slowly, draw a tincture, but fainter than the former, which being poured off, the remaining Musk may be employed for inferiour uses. Now that which made me mention this Preparation as pertinent to our present Subject, is this Phenomenon of it, that the first essence, or rather tincture, being smelt to by it self, has but a faint, and not very pleasing, odour of Musk, so that every body would not discover that there was Musk in it; but if a single drop, or two drops at most, were mixt with a pint, or perhaps a quart, of good Sack, the

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the whole body of the Wine would presently acquire a considerably musky sent, and be so richly perfumed both as to tast and smell, as seemed strange enough to those that knew the vast disproportion of the Ingredients.

F I N I S.
